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THE BRITISH JOURNAL

OF

OPHTHALMOLOGY

JULY, 1923

COMMUNICATIONS

BINOCULAR CHOROIDAL TUBERCULOSIS WITH DETACHMENT OF THE RETINA IN TWO KITTENS*

BY

J. B. LAWFORD AND HUMPHREY NEAME

LONDON

THE kitten, a half-bred Persian, about five months old, was apparently in good condition; it had not wasted appreciably nor failed to take food; it had been fed largely on milk from the household supply. The defect of sight appears to have developed rapidly, nothing unusual having been noticed by the owner until the animal walked into a small sunken tub containing water in the garden. I saw the kitten one morning in bright sunlight. The pupils were dilated, apparently motionless to light, and the animal as far as could be ascertained was unconscious of light and shade. I examined it again next day in a darkened room with artificial light and again failed to obtain any evidence of perception of light. In each eye there was extensive detachment of the retina easily seen by focal illumination and by the ophthalmoscope. Tension seemed normal, the corneae were bright and the lenses clear. Two days later the kitten was killed by chloroform: I removed the eyeballs and placed them in Zenker's fluid. I regret that there was no opportunity of examining the viscera of this kitten; the animal was brought to me in the country and I was unable to bring the body to the laboratory at once.

* Communicated at the Section of Ophthalmology, Royal Society of Medicine, at a Clinical Meeting, February, 1923.

The examination of the eyeballs has been made by Mr. Neame, and the description of the pathological changes is entirely his work. I take this opportunity of thanking him for the trouble he has taken and will ask him to give you a description of the specimens.

Shortly before this communication was made to the Section of Ophthalmology, another kitten from the same litter was brought to me for examination. It was well grown and healthy looking, but not as active or playful as kittens usually are. Its sight was apparently good, and the fundi did not exhibit any changes which I could recognize as abnormal. Between two and three weeks later the kitten was brought to me again, and examination then revealed detachment of the retina plainly visible in the left eye, less obvious in the right. The animal was obviously in distress, refusing food and lying still all day. I obtained possession of it and next day handed it to Mr. Neame, who has included it as Case 2 in his paper.

Pathological examination of the eyes of a blind kitten*

CASE 1.—Path. No. R.L.O.H. 1540.—The eyes were fixed in Zenker's fluid, and were divided horizontally.

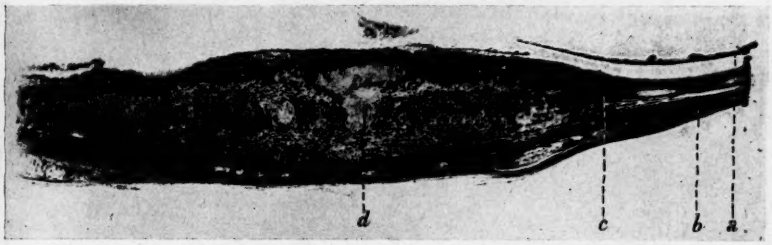
Macroscopic Examination.—A similar appearance was present in the two eyes. The anterior chambers, containing a loose granular coagulum, were about 2.0 mm. deep in the centre. The iris was retracted so as to leave a wide pupil. The lens appeared normal, and the ciliary body normal. The retina was completely detached, so that no vitreous cavity remained in either eye. The subretinal space was filled with firm powdery coagulum. The choroid was in situ, but on examination with a lens, revealed in each eye a definite diffuse thickening in the posterior part.

Microscopic Examination.—The half of one eye was embedded in celloidin, and sections were stained with Ehrlich's haematoxylin and eosin, and with Weigert's iron haematoxylin and van Gieson's stain. The sections show marked conjunctival and episcleral vascularization. The cornea shows a normal structure. There are a few foci of cell infiltration in conjunctival and episcleral tissue, but no apparent invasion of the cornea. The anterior chamber contains a few cells free in the angle and within spaces enclosed by the ligamentum pectinatum. The iris contains, in some of the sections examined, a small collection of lymphocytes at its root. There are small collections of inflammatory cells around the ciliary processes. The retina is completely detached, and has small areas of infiltration mostly around blood-vessels.

* Specimens shown at the meeting of the Section of Ophthalmology, Royal Society of Medicine, February, 1923.

At the ora serrata the choroid presents an oval mass of cells which for the most part are epithelioid in type. In the posterior part of the eye the choroid is involved over a wide area, and shows infiltration, mainly with epithelioid cells, but also with collections of lymphocytes here and there, and patches of necrosis. The latter are all nearer to the inner surface, and in places are separated from the subretinal space only by the thinnest layer of epithelioid cells and lymphocytes. Within this zone of granulomatous tissue many vessels are seen whose walls show proliferation of their endothelial lining, but no actual giant cells are to be seen.

The subretinal space contains a considerable amount of fibrinous and granular material and some cells scattered along the outer wall of the space.



CASE I. FIG. 1.

Microphotograph of part of tuberculous lesion in choroid. *a*. Pigment epithelium. *b*. Sclerotic. *c*. Choroid, at margin of tuberculous lesion. *d*. Caseation in the tuberculous mass in the choroid.

The condition is practically that of ulceration of the choroid into the subretinal space, with the passage of fluid and cells into this space, so as to cause detachment of the retina.

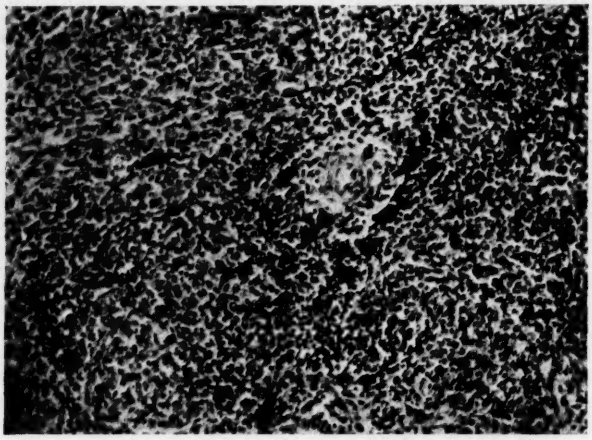
Prolonged search in sections stained by Spengler's modification of Ziehl-Neelsen's method failed to reveal any tubercle bacilli. (See note *re* further examination for bacilli.)

Illustration No. 1 shows part of the infiltrated area of the choroid, the total extent of which was about three times that shown.

Illustration No. 2 shows a typical part of the granuloma, with endothelial proliferation of a vessel in the centre, and a large proportion of epithelioid cells.

Hancock and Coats[1] described, in 1911, 6 cases of tuberculosis of the choroid in the cat. They found that this condition had, as far as the literature showed, been ignored. Of the six cats, most of which were young, five had bilateral disease. They were of various breeds, and their general condition was, in most of

them, good. In one only was there wasting. In two cases the temperature was raised to between 102° and 104° F. The condition was visible on examination of the fundus, as extensive areas of small spots of yellowish exudate beneath the retinal vessels. Retinal detachment was to some extent usual. Post-mortem examination of five of the cases failed to reveal any sign of tuberculosis in any other organ in one of them. In four, there was lung disease, in three, kidney disease, and other organs were affected in one. Inoculation of guinea-pigs with material from three of the cats gave



CASE I. FIG. 2.

Microphotograph, magnification ×175, of part of the tuberculous tissue shown in Fig. 1. Near the centre is a capillary with several layers of endothelial cells forming its wall. The black masses are choroid pigment. Close examination, particularly with a lens, discloses the abundance of epithelioid cells, many of whose nuclei appear as rings.

positive results—development of tuberculosis—in two. The organism was not found in the eye lesions. Comparison of the microphotographs here reproduced with those of Hancock and Coats shows a close resemblance in the granulomatous structure. In each case the preponderating cell is a large epithelioid cell. In Hancock and Coats' examinations giant cells were very rare, and caseation was not characteristic, but when present was usually more towards the inner aspect of the choroid as in the case here described. A number of cases of intraocular tuberculosis have been described in other animals, as referred to in the bibliography

of the above-mentioned paper. One case of this disease occurring in the calf is of particular interest in that the rarer complication of parenchymatous keratitis was present in conjunction with nodular iritis. The corneal opacity was in the form of interstitial streaks and spots, which proved on histological examination to be masses of cell infiltration between the lamellae (Priewe[2]).

Since the date when the specimen and sections of this case were shown at the Ophthalmic Section of the Royal Society of Medicine, further examination for the tubercle bacillus by a different method has met with success. Part of the thickened portion of the choroid of one of the eyes was removed and spread, partly by teasing, partly by pressure, upon a glass slide treated with egg albumen solution, and there fixed by heat. In one specimen so prepared the pigment of the uvea was removed by bleaching with hydrogen peroxide. In both this and the unbleached preparations scattered acid-fast bacilli were demonstrated by means of Ziehl-Neelsen's stain, with the morphological characteristics of the tubercle bacillus. This was confirmed by Dr. P. Fildes.

REFERENCES

1. **Hancock** and **Coats.**—"Tubercle of the choroid in the cat." *Veterinary Record*, Vol. XXIII, p. 443, Jan., 1911.

2. **Priewe.**—"Choroiditis u. Iritis tuberculosa nebst tuberculoser Keratitis parenchymatosa beim Kalb." *Berlin tierarztl. Wochenschr.*, p. 841, 1908.

3. **Mayou.**—*Trans. Ophthal. Soc.*, Vol. XXXIV., p. 319.

CASE 2.—Since the completion of the examination of the above described specimen, a second kitten of the same litter became blind. The animal was received alive and examination of the left eye was satisfactorily carried out. Details of the fundus of the right eye could not be seen clearly.

This kitten was said to be eleven months old and the only survivor of the litter. It was stated never to have been lively, and for the last ten days had become lethargic and had taken very little food. It was stated that the kitten had been fed on boiled milk from the table at breakfast, but on unboiled cow's milk from the dairy at other times. There was no history of any known illness among the inhabitants of the house in which these kittens were born, nor in the house in which the second kitten had lived from the age of six weeks. The milk supply to the two houses in which the kittens lived was obtained from different dairies. The mother was stated to be alive and healthy. A rough drawing of the fundus of the left eye was made before the animal was killed. The optic disc was visible between two large prominent retinal detachments, one on the temporal side, the other in the inferior

nasal region. Just above the lower detachment was a pinkish slightly raised area upon which coursed many delicate blood-vessels connected with the main retinal vessels (Fig. 3).

The animal was killed by means of chloroform. Both eyes were excised. Post-mortem examination of the viscera showed the following conditions (R.L.O.Hosp. Path. No. 1567):--

The lungs showed many tubercles of about 1 millimetre diameter and slightly larger, both on the surface and on section.

The bronchial glands on division were seen to be slightly

CASE II. FIG. 3.

Drawing of fundus of left eye, which shows a retinal detachment below, and another to the temporal side. Between these detachments is the disc at the edges of which appear the retinal vessels. Above and to the nasal side of the disc is a highly vascular area, which appeared slightly raised on ophthalmoscopic examination.

affected and to contain tubercles of less than 1 millimetre in diameter.

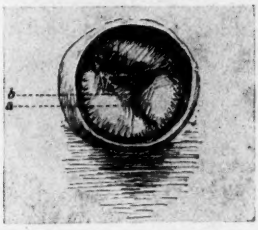
The mesenteric glands were very greatly enlarged, and contained confluent tubercles and caseating masses. One of these glands measured on cut surface 2.5 by 2.0 cm. The spleen also contained tubercles of varying sizes.

The large intestine showed on its surface circular patches of yellow-white colour, two to three millimetres in diameter. The peritoneal surface was not raised. The inner surface of the colon showed these patches to correspond with nodules in the centre

of each of which was a small depression. Portions of some of the organs were placed in a sterile vessel for inoculation experiments.

The specimens were placed in Bouin's fluid. The left eye was divided in the coronal plane a little way in front of the equator. Three large retinal detachments were present as shown in the drawing (Fig. 4). Enclosed between these was a depressed area which presented a somewhat corrugated surface over which many branching retinal blood-vessels were seen. The iris and ciliary processes were of normal appearance.

The posterior part of the left eye was again frozen and divided sagittally, to the nasal side of the optic disc, and as near as



CASE II. FIG. 4.

Drawing of left eye after removal of its anterior part by coronal section through the posterior ciliary region. Scale 1/1. It shows large retinal detachments below and to the temporal side, and a less prominent detachment above. Enclosed within the limits of these detachments is an area in which the retina is puckered. *a*. Marks the position of the optic disc, between the detachments. *b*. Shows the slight prominence which was visible on ophthalmoscopic examination as a pink highly vascular region.

possible through that part which corresponded with the pinkish vascular area figured in the fundus drawing. The cut surface shows homogeneous coagulated material beneath the large retinal detachments. Corresponding with the pinkish area referred to, the retina was slightly detached, and immediately beneath the latter was a solitary mass of greyish colour involving the choroid. This grey mass measured on its cut surface 5 mm. in length vertically, and 3 mm. antero-posteriorly.

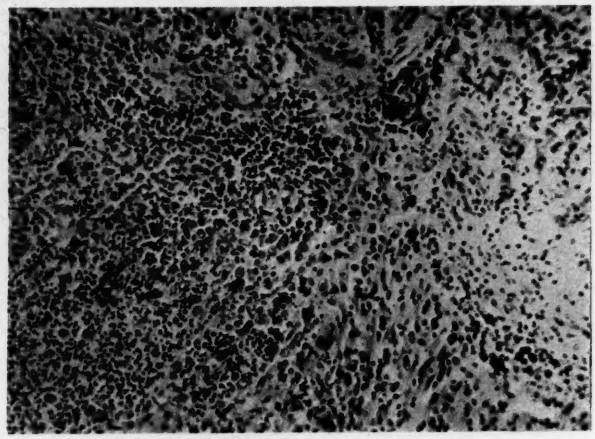
Microscopic Examination.—Spleen.—A smear preparation of a nodule, stained with haematoxylin and carbol-fuchsin, shows abundant acid-fast bacilli.

Mesenteric Gland.—A smear made from crushed tissue of the largest mesenteric gland, stained with Ehrlich's haematoxylin and Ziehl-Neelsen's carbol-fuchsin, reveals abundant acid-fast bacilli. A section of part of this gland prepared from tissue embedded in

paraffin, stained by the same method, also shows abundant acid-fast bacilli.

Colon.—Sections of two of the nodules show a granulomatous structure with loss of the covering mucosa, and slight necrosis external to that.

Left Eye.—Part of the choroidal mass with its covering retina and sclerotic was embedded in photoxylin and paraffin by Jordan's method. Sections stained with haematoxylin and eosin show a portion of the sclera with the whole of the choroid internal to it much thickened, and its normal structure replaced by granulomatous



CASE II. FIG. 5.

Microphotograph, magnification ×200, of part of the tuberculous lesion in the choroid, situated posterior to *b* in Fig. 4. It shows abundance of epithelioid cells as in Case 1.

tissue. The retina covering the inner surface of the choroidal mass is thrown into irregular folds, is highly vascularized with large capillaries, and is infiltrated with cells. Examination with Zeiss D objective and No. 4 eye-piece shows the following condition:—The central portion of the choroidal mass is necrosed; the peripheral part shows histological structure very similar to that of the choroid of the kitten previously described, but with the addition of a considerable number of polynuclear cells, especially at the margin of the necrotic area. The abundance of the epithelioid cells, the relative paucity of lymphocytes, and the absence of giant cells are the obvious feature (Fig. 5). Part of the retina is invaded by granulomatous tissue continuous with that of the choroid.

A section of the same portion of choroid stained with haematoxylin and carbol-fuchsin revealed, after prolonged search, the presence of a bacillus, acid-fast, and with the morphological character of a tubercle bacillus. This conclusion was agreed to by Dr. S. H. Browning who examined the section.

Inoculation Experiment.—Dr. Stanley Griffiths carried out inoculation experiments at the Field Laboratories, Cambridge, from which the following results were obtained:—" Emulsion of mesenteric gland produced tuberculosis in guinea-pig. Cultures of the tubercle bacillus were obtained directly from the mesenteric and bronchial glands. The cultures are dysgonic, i.e., they grow like tubercle bacilli of bovine tuberculosis."

Conclusion

The occurrence of blindness in cats is by no means common, and, as the result of binocular tuberculosis, is distinctly rare. The presence of tuberculosis in both eyes of each of two kittens of the same litter is probably unique. In one case the presence of the tubercle bacillus was demonstrated in the affected choroid of one eye. In the other case, in addition to the presence of tubercle bacillus in the choroid, this organism was found in abundance in a caseous mesenteric lymph gland, and in the spleen; cultures of tubercle bacillus were obtained from bronchial and mesenteric glands; inoculation of a guinea-pig gave a positive tuberculosis result; and lesions of tuberculous nature were found macroscopically in lungs, bronchial glands, spleen, large intestine, and mesenteric gland. The most advanced stage of tuberculosis was found in the mesenteric glands. It is probable that infection took place through the colon. Although no examination of the milk of the dairy of supply was carried out it seems highly probable that the second animal at least was infected from cow's milk.

CASES OF OPHTHALMOLOGICAL INTEREST FROM THE POST-MORTEM RECORDS OF ST. GEORGE'S HOSPITAL, LONDON, 1841-1921

BY

R. R. JAMES

LONDON

SOME few years ago I began to search the post-mortem records of St. George's Hospital to see if I could obtain any facts as to the numbers of those dying in a general hospital of metastatic deposits occurring after removal of an eye affected with malignant disease.

I was surprised to find so few examples of this condition; no doubt the records of the workhouse infirmaries would be a more fruitful field in which to search, that is, if any are kept in those institutions. I took notes in passing of any findings of ophthalmological interest, and although I failed in my primary object, yet, in view of the excellent way in which the records have been kept, over a long series of years, I thought it might be of some interest to give a brief account of my findings in these memorials of the dead-house.

St. George's is fortunate in possessing an unusually complete series of such records, extending now over a period of more than eighty years, a fact which was strongly emphasized by the late Sir William Osler, who, when he was shown the books, said, that they were by far the best series of post-mortem records with which he was acquainted. The series begins in 1841, and is complete to date; in 1844, the late Sir Prescott Hewett was appointed curator of the museum and he inaugurated the method of keeping the notes, which method has been followed ever since, and is in use to-day. Hewett devised the plan of writing the post-mortem notes on one side of the page, the left, while on the right-hand side is given a short *résumé* of the clinical history of the case by the registrar; such a method enables the pathologist to see at a glance the clinical history of any case, and the clinician to see the pathological findings.

During these eighty years nearly 28,000 deaths have been entered on the books and roughly speaking more than two-thirds of this number have undergone a partial or complete post-mortem examination; the eye is not as a rule likely to have been examined if the head was not opened. So far as I am aware, the method of examining the eye has usually been as follows: the roof of the orbit is cut away, the eye defined, and opened at the equator with a pair of sharp-pointed scissors and the posterior half, with a portion of the optic nerve removed and floated out in a dish of water; thus the changes described in this paper are for the most part naked eye changes; very rarely, indeed, is it noted that any microscopical examination has been made; it is obvious that it would be a waste of time embedding and cutting sections of the vast majority of fragments removed in this way.

For my present purpose, it is convenient to divide the material which I have collected into two sections, cases occurring before 1888, and those after and including that year. Some curators have been more industrious than others, but, on the whole, a very high average of completeness of examination has been reached.

In the first section it is easiest to give short abstracts of the cases noted; in the second, I propose to group the findings under ophthalmological headings.

In the first year of the series occurred the case of a male with carcinoma of the antrum and meningitis, and it is noted that the cavernous sinus was full of pus, an example of thrombosis of the cavernous sinus; the specimen is preserved in the museum. Two cases of malignant disease of the antrum, involving the orbit occurred in the years 1845, 1846. In 1847, an interesting case of tetanus was noted, following a wound of the eye in a male, aged 33, inflicted by the lash of a whip. The man was admitted early in the year, symptoms of tetanus made their appearance six days after admission, and in four days' time the man was dead. Post-mortem, the eye was an abscess, with a perforation of the cornea, and there was infiltration of the orbital tissues. In the same year, in a case of apoplexy, a cyst of the ophthalmic vein, with calcareous wall was found. In 1848, a case of thrombosis of the cavernous sinus following a tonsillar abscess was noted. In 1852, occurred a case of thrombosis of the left optic vein, with protrusion of the eye, secondary to middle ear disease.

In 1853, there was a curious case noted as follows: ptosis, with fixedness of the eyeballs, in a male, aged 36; sudden dyspnoea, sphenoid disease. The clinical abstract is as follows: The man was admitted with paralysis of certain of the cranial nerves; dimness of sight had been complained of for six months previous to admission, there was also a history of giddiness and diplopia; ptosis began on the left side and later on was noted on the right side as well; there was a history of running at the ears some years previously. On admission, the eyeballs were fixed, the axes parallel, the globes motionless; the pupils were noted as acting freely, there was double ptosis, thick speech, defective articulation and some difficulty in swallowing; the loss of power in the fauces increased, and the man died suffocated. The post-mortem notes are as follows: the surface of the body of the sphenoid continuous with the basilar occiput was very injected, it became more porous and more softened on approaching the posterior clinoid processes; two or three small projections of bone existed on the surface just behind the sella Turcica, and the bone forming the posterior surface of the sella was vascular also. The arachnoid and pia were perfectly natural, the dura adherent in places to the calverium; the subarachnoid fluid was slightly increased in amount, and there was an increased amount of fluid in the ventricles; the brain, vagus and optic nerves were examined without any abnormality being found; the eye muscles were noted as being very fatty. This case was reported by the curator, Dr. John Ogle, and will be found in the *Transactions of the Pathological Society*, vol. 10, p. 224.

The year 1854 saw a great increase in the number of deaths entered on the books from the cholera epidemic which raged that

year; many of these cases were not examined. In this year occurred a case of a child of three years old with purulent ophthalmia, scarlet fever, and diseased kidneys; the scarlet fever appeared after admission, the kidneys were of the large white variety, and the ophthalmic condition appears to have been phlyctenular conjunctivitis. In the same year, a woman of seventy-three, who died from diffuse inflammation of the forearm is noted as having a cataract.

The year 1857 produced a harvest of cases; a female child of eight years with strumous glands had an old perforated corneal ulcer which had healed with partial staphyloma; a male of thirty-seven with compound fracture of the lower jaw and pyaemia had a hypopyon; a female of twenty-eight had malignant disease of the left frontal bone involving the orbit and displacing the eye; the specimen is in the museum; a male of sixty-five, who had been blind for twelve years, had chronic white softening of the brain and spinal cord; the optic nerves were diminished, pearly in colour, and no healthy nerve tubules could be seen on section; the optic tracts were flattened, thinned, and gelatinous in appearance; the optic thalamus was softened, the corpora quadragemina appeared healthy, and the cerebral vessels were atheromatous.

In 1858, two cases were noted: the first was in a female forty years old, a case of burn; in the right eye the cornea was softened, flaccid and opaque; on turning this structure back, a thick layer of lymph was found on the surface of the iris; the lens was normal. The patient had been in a typhoid state for about three weeks, with occasional bouts of delirium. This appears to me to have been a case of ulcus e lagophthalmo. The second case was that of a child of seven with a malignant tumour of the orbit; he had been admitted in April and he died in October. There was an ulcerating fungating tumour projecting from the left orbit, this tumour was attached to the periosteum at its upper part, but did not involve the bone; the optic nerve was much elongated, and was traced through the tumour to the remains of the eye which lay on the cheek. On dividing the eye, the shrunken choroid was recognized lying loosely enveloped in the sclerotic, which latter was distinct from the growth, though closely adherent to it; the brain and other organs were healthy. The child had been admitted with proptosis and a history of fullness of the upper lid of four months' duration; the growth rapidly increased in size, no operation was performed, and the eye had slowly shrivelled up.

In the next year, in a case of pyaemia, an abscess in the orbit was noted.

In 1861, a female, aged sixty-seven, died of bronchitis after extraction of cataract performed by the late G. D. Pollock; the eye

was noted as being sound. In the same year, the arcus senilis finds its first mention in a case of injury.

In 1862, a female child of four years was noted as having a fungus haematodes of the eye; evidently this was a case of glioma, secondaries were found in the brain, but the remaining organs were not allowed to be examined.

In 1864, a male, aged forty-four, with pyaemia was noted as having an abscess in the left eyeball; and in the same year, a female, aged twenty-two, with large white kidneys was noted as having opaque whitish retinae; these were not examined microscopically.

In 1867 and 1872, cases of pyaemia with pus in the eyeball occurred; arcus senilis is mentioned in a middle-aged male; and the case of a lunatic is given, who threw himself out of a window, and who was brought in dead; in this case there was a cicatrix at the inner canthus of the left eye; the eye was shrunken, the choroid showed ossification, and close to the optic disc there was a mass of fibrous tissue which enclosed a small fragment of lead.

In 1873, a case of pyaemia was noted as having serous oedema of the orbital tissues; no pus was found, and the eyes were natural.

In 1874, a male child of twelve years of age, with granular kidneys, showed exudation and haemorrhage in each retina; in the same year in a granular kidney case it was noted that the left eyeball was staphylomatous, the right had been excised at some previous date. Arcus senilis is mentioned in the following year; in 1879 a female twenty-four years of age had purulent meningitis and an abscess in the left orbit; the clinical history of this case had not been written up by the registrar.

In 1880, a male child thirteen years old had an orbital abscess, with abscess in the frontal lobe and a doubtful fracture of the orbital plate; there was a history of injury four months before.

In 1882, a case of Graves' disease died of emaciation; the prominent globes are mentioned.

In 1883, occurred a case of anaemia with haemorrhages in the retina; the blood count in this case showed as many white cells as red, the reds were granular.

In 1885, three cases are noted as having unusually dilated pupils.

In 1888, Dr. F. G. Penrose was appointed curator of the museum; he was a keen clinical observer and used the ophthalmoscope in the wards as a routine; this may account for the sudden increase in the eye findings entered on the post-mortem records.

From this date it is more convenient to arrange the cases in groups.

Injuries.—Excluding ordinary black eyes and conjunctival ecchymosis, the following conditions were found. Laceration of the eye in a case of fractured base. Two cases of ruptured globes

in fracture of the skull and maxilla respectively. Two cases of bullet wounds of the frontal region, in each of which the eye was collapsed. Six cases of fractured skull in which the orbit is noted as being full of blood, and one case of fractured base in which it is quaintly noted that one of the eyes had been spoilt in former years.

Conjunctiva.—Icteric tint in cases of jaundice is of frequent occurrence. Chemosis is noted thrice. A case of streptococcal conjunctivitis occurred in a baby a month old who died of gastro-enteritis. Purulent ophthalmia is noted in a case of erysipelas of the head.

Cornea.—Bilateral ulcers were noted in an infant dead of broncho-pneumonia. Opacity of the cornea was noted in the case of a young female dead of diabetes. Vicious ulcers were noted in a baby, aged eight months, with acute nephritis. Cornea decomposed in a case of generalized tuberculosis. Nebula in a case of morbus cordis. Corneal opacities with anterior staphyloma in a baby dead of pneumonia. Opaque corneae, shrunken globes and blepharitis in a baby who was dead from broncho-pneumonia. Arcus senilis was found in many cases.

Iris.—Old iritis was noted in a case of rupture of the bladder. Irido-cyclitis occurred once in a case of pericarditis and septic-aemia.

Lens.—Cataract is only mentioned four times.

Choroid.—Tubercle occurs for the first time in 1888; the case was one of phthisis in a male, aged thirty-one; besides this, there are twenty-three cases of choroidal tubercle in cases of generalized tuberculosis. It is interesting to note that in a few cases of this condition, three or four at most, the eyes are expressly stated to have shown no signs of choroidal tubercle. Two cases of choroiditis were noted, one in a male dead of gastric carcinoma, and the other in a case of morbus cordis, in which much atrophy of the choroid was noted as well. Neoplasm. Benign. One case of melanoma of the choroid which was diagnosed during life by myself in a female who was admitted unconscious, and who died of apoplexy. Malignant. All were melanotic. A male, aged thirty-seven, who died of secondaries in 1896, the eye having been removed for tumour at the Royal Eye Hospital in 1894; a male of thirty-one, who died of deposits in the liver in 1899, the eye having been removed at the Royal London Ophthalmic Hospital in 1897. A male, aged sixty-four, died of secondaries in the liver in 1919 with the primary growth in the eye still in situ; he had had some treatment at another hospital some months earlier, but the eye had not been removed, nor had the growth burst through the sclerotic. This is a suitable spot in which to place the case of a male of forty-five who died of malignant disease

of the dura mater, and of the cervical glands in 1899, whose eye had been removed for hypopyon at St. George's in the previous year; the eye does not appear to have been examined after removal, at least I could find no record of its having been done.

Retina.—Albuminuric retinitis was noted in thirty-three cases. Retinal haemorrhage in cases of renal disease not indexed as albuminuric retinitis was found in seventeen cases. Retinal haemorrhage in cases of anaemia was noted in the following cases: aplastic, one case; pernicious, five cases; idiopathic anaemia, three cases; leucocythaemia, two cases; purpura haemorrhagica, three cases; haemorrhagic diathesis, one case. Retinitis pigmentosa was noted in one case. Opaque fibres in the retina were found in one case. Retinal haemorrhages were noted as being found in the following cases: pneumonia, meningitis, malignant disease of the sternum, emphysema with fatty heart, two cases of surgical kidney, fractured skull, cystitis with fatty heart, cerebral haemorrhage, spinal meningitis with arrested sexual development, calculus obstruction of the ureters, diabetes, sarcoma of the base of the skull, choroidal sarcoma, toxaemia, and in eight cases of morbus cordis. One case of small white kidney was noted as having healthy retinae. Detachment of the retina occurred in one case only, it was in a male, aged twenty, who died of small white kidney and heart failure, the retinal condition had been diagnosed during life; this retina was examined microscopically, and found to be full of exudation and haemorrhage.

Orbit.—Abscess was found in five cases; malignant disease noted in seven cases, for the most part either in cases of apoplexy or of fractured skull. Distension of the sheath was found occasionally in cases of meningitis and of cerebral tumour. The optic nerve was torn across in one case of fractured skull. Optic neuritis was found in sixteen cases of cerebral tumour, in four cases of cerebral abscess, in four cases of apoplexy, with disease of the cerebral arteries and sinuses, in five cases of chronic renal disease, in six cases of meningitis, and in two cases of pyaemia. Optic atrophy, apart from atrophy of the nerve in cases where the eye had been previously removed was noted in six cases.

Orbit.—Abscess was found in five cases; malignant disease in one case; exophthalmos was noted in two cases of Graves' disease; phthisis bulbi was noted in two cases, and panophthalmitis in one case of cerebro-spinal fever.

Both eyes were noted as destroyed in a baby of three, dead of broncho-pneumonia, and the eyes were noted as glistening in a case of prussic acid poisoning.

I am afraid that little of real importance emerges from this research into the post-mortem records; it is interesting to note the extraordinarily varied number of morbid conditions in which

retinal haemorrhage was found. No one can be attached to a general hospital for very long without quickly becoming cognizant of this fact, and it is one which might with advantage be more emphasized than it is in our textbooks. The case of tetanus is interesting. Of course it occurred many years ago, and although nothing is said either in the case records or in the post-mortem notes of there being any other wound to account for it than the wound of the eye, it is possible, in fact I should think it very probable, that some other focus of infection existed. There can be no doubt of the tetanus, our forefathers in the profession knew tetanus when they saw it, but I do not think that I can count this case definitely among the very few which have been recorded where the wound in the eye was the primary cause.

The prominence of the globes noted in all three cases of Graves' disease shows that those who maintain that the exophthalmos does not persist in these cases after death are incorrect.

I have to express my best thanks to Dr. Robert Donaldson, Curator of the museum and Pathologist to the Hospital, for permission to extract these notes from the records, and for much kindly help.

A SERIES OF ONE HUNDRED CASES OF CATARACT REMOVED UNDER A SUBCONJUNCTIVAL BRIDGE

BY THE LATE

CHARLES KILLICK, M.D., F.R.C.S.

BRADFORD

No one, I think, should have the temerity to lay down the law about the merits or drawbacks of any particular operation unless he has performed it a great number of times. As I have, in the course of a fairly long professional career, extracted some 1,500 cataracts, I am in a position to know something about my subject and may claim to be acquainted with its various difficulties and complications. There can hardly be one that I have not come up against, I must have committed every possible fault and perpetrated every blunder known to the ophthalmic surgeon, including inserting the knife with its cutting edge downwards on no less than three occasions, until at last I have entered upon the calm waters of efficiency I trust, so far at any rate as cataract extraction is concerned. My practice has always been to make the incision with puncture and counter-puncture at the limbus, to include nearly

half the cornea and to complete the section with a conjunctival flap of greater or less extent. The results have not on the whole been unsatisfactory and not much worse I hope than other people's, and yet for some time past I have altered my technique, and with very few exceptions, have done all my extractions under a subconjunctival bridge. Two main factors have influenced me in making the change, first a careful perusal of Terrien's description of the method which you will find in his excellent and recently published edition of "La Chirurgie des Yeux et de ses Annexes"; for it had somehow never occurred to me before that to convert my conjunctival flap into a bridge it was only necessary to make it a little larger and abstain from cutting it through when withdrawing the knife. The second was that I had had two patients, both of whom had a terrible loss of vitreous, ending in the one case in haemorrhage and total loss of the eye, and in the other in very poor vision. These cases, coming as they did almost on the top of one another, made me wonder whether subconjunctival extraction, although it might be more difficult, would not tend to prevent, or at any rate lessen, the danger of this undesirable complication.

Extraction under a subconjunctival bridge is no new device; in 1855 Desmarres strongly advocated it in the second edition of his book " Les Maladies des Yeux," and a full description is given, illustrated by some admirable drawings. Why the method fell so completely into oblivion, and was in fact abandoned by the master himself, after a short trial, in favour of a limbal incision reinforced by a conjunctival flap, fills me with surprise as its advantages are many and its difficulties, as I hope to show, very few. One of the reasons, perhaps, why Desmarres came to dislike the procedure was on account of haemorrhage from the conjunctiva, which he states may be troublesome. If this is a reason it would not hold good to-day owing to the discovery and use of adrenalin. A much more serious difficulty as I have found out by experience, is that the delivery of the lens is sometimes less easy to effect. It was not until nearly fifty years later that Vacher in 1899, and Pansier in 1898, working independently, again gave the method a trial, the former publishing a series of forty, and later still eighty cases, but his work only met with a lukewarm reception. Pansier, who at first was ignorant of Desmarres' original work, published his first list of sixty cases in 1899, and two years afterwards, reported that in the last 160 cases done in this way he had had only one case of sepsis, in a patient with diabetes and dacryocystitis, and in only one other case had he been compelled to divide the bridge. More recently still the method has had its advocates in Bajardi, Lundsgaard and Cridland.

Operating, of course, long before the introduction of local anaesthesia Desmarres recommended the procedure chiefly because it did away with the danger of excessive gaping of the wound and the turning over or "renversement" of the corneal flap, which is liable to occur when there is an excessive escape of vitreous. He admits that his operations were limited in number, but that no accident had occurred capable of compromising vision.

As his illustrations show, he made his conjunctival bridge of the same width and height which Terrien recommends, i.e., just about equal to a third of the total incision, the only difference being that a Beer's knife was used for making the section instead of the narrow cataract knife of the present day. He opened the capsule with the point while traversing the anterior chamber, a manoeuvre imitated by Pansier. So far I have not copied his example in this respect. Desmarres, moreover, after his first two or three operations, recommended that the section should be made downwards on account of the tendency for the eye to roll upward, and he states that the bridge is easier to make by so doing. But, the difficulty of operating before the days of cocain must have been tremendous, and since its introduction no one, I think, would deliberately prefer to make an inferior section. If the lateral buttonhole was too small he either enlarged it with scissors, or, as the only alternative, cut the bridge across, thus converting it into an ordinary conjunctival flap. His final judgment was that the method was difficult and called for considerable experience in the cataract operation. It was, however, the best means of preventing eversion of the cornea, and prolapse of iris.

The method I adapt is frankly copied from Terrien; the width of the bridge varies, it may sometimes be as large as a third of the whole incision, more rarely it may be merely a small tether about two millimetres broad, perhaps from about four to five millimetres on the average. As soon as the knife has completed the section it is turned backwards and made to glide beneath the conjunctiva for about six millimetres in fact as far as possible; the longer the bridge the easier the extraction and the broader it is the better as it ensures coaptation of the lips of the wound, an important point when performing simple extraction. As a practical point care must be taken when completing the bridge lest the edge of the knife should touch the speculum at the point where the latter rides beneath the upper lid, or its edge will be spoilt. It is just a little difficult to avoid doing this at first. The bridge is just as easy to fashion in those cases where preliminary iridectomy has been done. It is difficult to make it of adequate dimensions where the palpebral fissure is narrow, and this constitutes the principal contraindication to the method.

The ordinary technique is then followed except that of course everything must be done subconjunctivally. If combined extraction is to be performed iridectomy must be situated laterally either to the inner or outer side of the bridge, everything must be done subconjunctivally. Terrien recommends the inner side, I prefer the inner for the right eye and the outer for the left eye. Aesthetically, perhaps, the appearance is not quite so good as when the coloboma is in the usual position, but it is covered by the upper lid and need not be large, indeed, the less iris excised the better. In selected cases simple extraction may be preferred, in my series there are fifteen, marred, however, by one small prolapse of iris (No. 75). In this case, however, the patient made a good recovery with 6/18 vision. Pansier reports one case of prolapse in fifty-two bridge extractions, and Vacher had not a single case in eighty. It is clear that the bridge is not an absolute safeguard against prolapse.

The capsule having been opened with a cystotome introduced through the lateral coloboma, the road is opened for extraction and now comes the real difficulty. The ease with which the lens is delivered varies with each case, it will depend partly on the kind of lens which is being dealt with; a ripe cataract with plenty of soft cortex can be removed to perfection, while another, which may be harder, stickier, or bulkier, may not escape so readily. A great deal depends upon the bridge, an extra millimetre in the height of this may make all the difference between easy birth and difficult labour. Sometimes a lens is hung up under the bridge and has to be assisted out with a spatula, sometimes it is just a question of manoeuvring. In four cases I had finally to divide the bridge in order to let the lens out; the more one gains in experience, however, the less likely it is that one has to resort to this expedient. As the cases in my series are not selected, but include every type and variety, the fact that the bridge had to be divided in only four per cent. shows that generally speaking it need only be resorted to very exceptionally.

According to Vacher and Bajardi, the exit of the lens may be promoted by inserting the spatula underneath the bridge and then depressing the upper lip of the wound. I have tried this and have found it to be unnecessary; Terrien states that simple pressure on the lower part of the cornea is sufficient. The technique will vary slightly according to the necessities of each case. Owing, however, to the protection and security which the bridge affords considerable pressure may be applied in cases of difficulty without fear of rupturing the hyaloid membrane as it is impossible for the lips of the wound to gape to a dangerous extent, or for the cornea to be forced backwards by a mass of prolapsed vitreous; once

the lens has started on its journey all that is necessary is gentle guidance, and it must be kept moving in the right direction, obliquely upwards and laterally. I feel sure that the difficulty sometimes encountered in getting the lens to emerge has contributed more than anything else to bring the operation into disfavour. The last traces of cortex are possibly rather more difficult to remove by this method, but even in extraction in the ordinary way it is impossible in many cases to be absolutely certain that all has been got rid of, and until a safe and certain method of removing cataract and capsule together has been devised, and I am not quite convinced as yet that Barraquer's operation fulfils these conditions, the complication of after-cataract will always be with us. My series demonstrates, however, that I have had no very serious trouble with after-cataract as I have only had to needle fifteen times so far, and some of the discissions were not for after-cataract proper, but for wrinkling and folding of a transparent capsule coming on after a lapse of time.

The operation is brought to an end in the usual way by smoothing out any folds in the iris, atropin is instilled in cases where iridectomy has been done, and eserin if it has not. I generally apply a binocular dressing, but it is not essential, and many cases do perfectly well with a single pad. They walk back to bed except in cases of simple extraction. Pansier recommended a monocular dressing and asserts that it may be dispensed with after forty-eight hours. The patient need not even go to bed. One of his patients went back to his shop half an hour after extraction, and continued to serve his customers as if nothing had happened. My patients are dressed and the eye inspected after the first twenty-four hours. They get up on the third day, and not infrequently on the second, or even twenty-four hours after operation; glasses are given on the fifth, sixth, or seventh day.

Unfortunately, I cannot claim that the method is an absolute safeguard against infection. My series is marred by two cases of panophthalmitis. The first (No. 66), perhaps, is attributable to the patient herself. She was a diabetic, and I safely removed a cataract from her right eye a few months previously. She returned home, her health deteriorated in the interval, and I should have been wiser not to operate on the second eye. Extraction was followed by suppuration. The second case (No. 40), also occurred in a patient with sugar and albumen in the urine, so that it is hardly fair to criticize the method in either of these. Sugar was present in nine of the series, rather a large percentage. All made good recoveries, with the exception of the two mentioned. But, apart from this horrible accident the operation has distinct advantages, the most important of which is that the danger of

loss of vitreous is almost if not quite eliminated. No loss of vitreous occurred in the series from beginning to end, and a significant point is that in three cases Nos. 36, 37, and 52 loss of vitreous had occurred in the case of the fellow eye, operated on by an experienced colleague. Once the bridge has been safely fashioned, the surgeon has complete control of the eye, however restless or stupid the patient may be, and Cridland remarks that so far as the patient is concerned it converts the operation from a big trial to a small one.

Serious iritis occurred in three cases with the formation of an inflammatory after-cataract in two (Nos. 50 and 59). Post-operative astigmatism is certainly no greater, although the contrary has been stated by Harrison Butler and others. Lastly, the operation has proved of distinct value in hospital patients, especially in men, who are often careless and apt to damage their eyes after operation. There were numerous cases of hyphaema in the series, but in no instance was the wound seriously disturbed, and all made good recoveries.

As an objection to the operation, Panas urges that the bridge constitutes a complication and makes it less easy. He is quite right in that, the method does demand a little more skill and experience than ordinary extraction. I do not recommend it until one has become thoroughly conversant with extraction in all its varieties. Harrison Butler has stated that it is wrong in principle as the closed pouch around the incision leads to delayed healing, to haemorrhage into the A.C., and to prolapse of iris. I can only say that so far I have not come up against these disadvantages. The one positive contraindication that I know of is, as before mentioned, a narrow palpebral fissure; in such a case it is impracticable to make an adequate bridge.

As Critchett says, however, we must be eclectic in our operations for cataract, and while I am not going to assert that it is the operation for choice in every case, I can only say that for the fully ripe cataract of the ordinary type it is almost ideal and I commend it to your notice with the fullest confidence.

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LIST OF CASES.

No.	Name	Sex	Remarks	Vision
1	C	M		6/36
2	H	M	Discission	6/18
3	F	M		6/12
4	T	F		6/24
5	K	F		6/9
6	S	F	Diabetes	6/24
7	P	M		6/24
8	D	M	Discission	No record
9	C	M		6/24
10	J	F		6/9
11	B	F	Diabetes. Bridge divided	6/24
12	A	F	Myopia. Nebulae	6/60
13	H	M		No record
14	T	F	Simple. Discission	6/18
15	T	F	Diabetes	6/60
16	W	F		6/24
17	T	M		No record
18	W	F		6/18
19	M	F		6/12
20	N	F		No record
21	H	F		6/9
22	A	F		6/24
23	B	F	Diabetes. Bridge divided. Discission	6/18
24	H	M		6/60
25	P	F	Iritis. After-cataract. Discission	
26	D	M		6/18
27	P	M		6/36
28	R	F		6/9
29	P	F	Feeble minded	
30	W	F	Diabetes	No record
31	B	F		6/12
32	B	F	Discission	6/12
33	F	F	Discission	6/6
34	B	F	Discission	6/18
35	D	M	Vitreous lost when other eye was operated upon. Discission	6/18
36	M	F	Discission	6/18
37	M	F	Vitreous lost when first eye was operated upon	6/18
38	L	F	Simple. Conical cornea. Discission	6/24
39	S	M		6/36
40	C	F	Diabetes and albumen. Panophthalmitis	
41	C	M	Optic atrophy	6/60
42	C	M		6/18
43	T	F	Discission	6/12
44	R	M	Bridge divided	6/12
45	D	M	Simple. Discission	6/9
46	F	F	Discission	6/24
47	S	F	Simple. Discission	6/9
48	T	M	Simple	6/12
49	C	M	For secondary cataract	
50	R	M	Myopia	
51	B	F	Iritis. After-cataract	
52	B	F	Simple. Discission	6/36
53	B	F	Simple. Vitreous escaped at first operation	6/24
54	H	F	Myopia	
55	H	F		6/18
56	T	F	Simple. Discission	6/18

No.	Name	Sex	Remarks	Vision.
57	L	F	Simple	P.L.
58	R	F	Diabetes	6/36
59	T	M	Simple	No record
60	P	M	Divided bridge. After-cataract. Iritis	
61	S	M		6/9
62	G	M	Simple	6/18
63	S	M	Simple	6/18
64	R	F		No record
65	J	F	Discission	6/18
66	R	F	Diabetes. Panophthalmitis	
67	K	F	Myopia and atrophy	P.L.
68	A	F		6/36
69	L	F		6/18
70	L	F	Simple. Discission	6/9
71	B	M		6/12
72	C	F		6/18
73	R	M	Myopia	6/60
74	B	M		6/9
75	A	F	Simple	6/9
76	P	F	Simple. Iris prolapse	6/18
77	P	M		6/18
78	L	F	Conical cornea	
79	J	F		6/12
80	A	F		6/18
81	P	F	Diabetes	
82	H	M		6/60
83	H	M	Leucoma. After-cataract. Discission	
84	E	M	For secondary cataract	
85	B	M		6/12
86	W	M		6/9
87	L	F		6/9
88	B	F	Illiterate	6/60
89	F	F		
90	F	F	Simple	6/24
91	H	M	Iritis	
92	L	F	Simple	6/12
93	H	M	For secondary cataract	
94	S	F		
95	O	M		
96	A	M		
97	C	F		
98	S	F		
99	S	F	For secondary cataract	
100			No details	

AN ACCOUNT OF AN EXPERIMENT ON VISUAL AFTER-SENSATION IN REFERENCE TO ILLUMINATION IN COAL MINES CARRIED OUT BY THE NATIONAL INSTITUTE OF INDUSTRIAL PSYCHOLOGY

BY

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LONDON

AN attempt was made to measure the effect, as shown by the number and duration of visual after-sensations, of the ordinary miners' lamp in various positions in relation to the eye of the subject, and with various methods of diffusing the source of light. The experiments were carried out in a dark room, and pit conditions were reproduced as far as possible, a standard miners' electric lamp of one foot candle power being used throughout the experiments. A preliminary series of experiments was carried out which showed that a stimulus of two seconds duration was sufficient to produce well recognized after-sensations, and the same length of stimulus was ensured by means of a kymograph drum. The subject was seated at the centre of an arc of a circle 21 inches in radius, his head being supported by a chin rest; and he was instructed to fixate a small white spot at eye level on the black wall opposite. The stimulus was applied by switching on the light at seven different positions in the arc, viz., at a zero position directly in front of the eye of the subject, and at 30, 60 and 90 degrees to his right or left. Five readings were taken in each position, and the subject was asked to count his after-sensations and say when they ceased. The average of five mining subjects was:*—

90° L	60° L	30° L	Zero	30° R	60° R	90° R
No. 0·8 D 16·1	No. 1·1 D 25·4	No. 1·5 D 25·6	No. 2·9 D 40·0	No. 1·8 D 23·5	No. 1·1 D 25·9	No. 0·9 D 20·3

Twenty seven miners were tested with the lamp at zero position only in order to see how many of them were subject to after-sensations. The average number of after-sensations was 2·2 (ranging from 0·2 to 8·4); the average duration of the after-sensations was 51·3 seconds (ranging from 7·2 to 114). Five subjects had so many after-sensations that they were unable to count them.

Experiments were carried out on two subjects with the lamp one foot above eye level, at eye level, and one foot below the eye level. One foot above the eye level was found to be the least irritating position, there being no after-sensations at all at 90° right and left.

A series of experiments was also carried out with various

* No. = number of after-sensations. D = duration of after-sensations. R = Right. L = Left.

methods of softening the effect of the light stimulation and of altering its colour. The best results were obtained by treating the outer glass with hydrofluoric acid and so rendering it translucent. The illumination of the standard and the translucent lights were measured by two independent observers by means of a Holophane lumeter, and it was found that the translucent light had an illumination 28 per cent. less than the standard lamp.

Thirty miners were tested for visual acuity with the standard and the translucent light by the method described by Flügel in the *British Journal of Psychology*, Vol. XI., 289. The results showed that with fifteen subjects visual acuity was better with the translucent light, with nine subjects visual acuity was equal with both lamps, and that with four subjects visual acuity was better with the standard lamp.

With nystagmic subjects the number and duration of after-sensations was more marked than with others, and tests showed that these subjects were those who appreciated the effects of the translucent light most.

The new lamp has found great favour with the miners, and is being supplied to them as fast as it can be manufactured.

The manager reports that "the men who have worked with the electric lamps fitted with opaque protecting glasses are very pleased with them, finding their work more comfortable, less strain on their eyes, and would not like to go back to the ordinary clear glasses again."

(A more detailed account of the experiments will be found in the *Journal of the National Institute of Industrial Psychology*, Vol. I., No. 5, and in the *British Journal of Psychology*, Vol. XIV., No. 1.)

THE VISION OF RAILWAY SERVANTS

BY

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THE interesting communication of Dr. Leonard Mitchell published in your issue of July, 1922, on the Vision of Railway Men, raises quite a number of problems to which I should like to draw attention briefly.

1. The occasions to which he refers on which Dr. Orr, Dr. Murray and I tested the capacity of people with normal and supernormal vision to recognize signals in the open air showed conclusively that all such efforts are doomed to failure, if anything like accurate standardization is required. On these three occasions the distance at which the semaphore was recognized by people with normal

vision varied enormously, as the subjoined reports show. We soon recognized that the distance at which the semaphore can be recognized depends on:—

1. The background, very materially.
2. The atmosphere, very materially.
3. The colour of the semaphore, to some extent.

We consequently decided to advise the Commissioner of Railways that open-air tests were certain to give trouble, that they were inaccurate, and that testing should be conducted indoors under standardized conditions.

2. A semaphore differs altogether from an ordinary test object, and if, as Dr. Mitchell says, it subtends an angle of five minutes at the given distance, it is certain that anyone with normal vision could see it much further away provided that the atmospheric conditions were good. It must, of course, be borne in mind also that with Snellen's types the details of the letters subtend an angle not of five minutes but of one minute. The arm of the semaphore, in the instance given by Dr. Mitchell, subtends an angle of five minutes lengthways and one minute in the other diameter; but a semaphore cannot be regarded as an ordinary test object, since it is really an opaque object on a light ground when the semaphore is properly placed.

3. The secondary colour defect, due to lowered visual acuity, of course simply reduces the distance at which coloured light can be recognized at night. Sir William Abney's well-known reference to the fixation of a standard of 6/12 for mariners was because he found that ships' lights could be recognized by people with 6/12 vision at a sufficient distance to ensure safety under ordinary conditions. Railway lights are not the same as ships' lights, and different considerations must apply.

4. If men are to be admitted to a Railway Service with vision of 6/12 in each eye, there must be some ascertainable reason for the defect (usually refractive). As such men get older their vision is almost certain to deteriorate. In other words, they would be starting at the margin of safety.

5. The visual standards adopted in the Pilot Service of Victoria seem to me to be quite satisfactory, both from the point of view of safety, and of justice to the employee. The men entering the service must possess 6/6 vision in each eye, and have a total error of refraction not exceeding one dioptre of which 0.5 dioptre may be astigmatic. They may not be excluded from the service so long as they possess vision of 6/12 fully in each eye, that is practically 6/9 with the two together. They are in an occupation with defined duties, they have the benefit of the experience gained from their work, and they possess at least the minimal standard which Sir William Abney regarded as just sufficent.

The Report which follows is that to which Dr. Mitchell replies.

Report

Resbecting the Examination of Vision for a Semaphore on the Werribee Line, Sunday, February 12, 1898.

The distance at which the arm of the semaphore could be seen by those possessing 6/6 vision depended largely on the background. With a grey mountain background it could be seen distinctly at a distance of 2,000 yards on the day in question, but against the background of the Station House, that is, as seen from the line, it is doubtful whether it could be seen at 600 yards by anyone possessing 6/6 vision. Taking for the particular day in question 2,000 yards as the standard, we found that Dr. Murray, who has vision 6/9 in one eye, was able to distinguish the signal with that eye at 1,300 yards, and Mr. Beck, with vision of rather more than 6/12 in one eye, and perhaps a little under 6/12 in the other, was able to distinguish the signal at 1,000 and 800 yards respectively. The examination disclosed the utter impossibility of fixing a definite standard, since at the two previous examinations made by Dr. Orr and Dr. Murray on different days the maximum distance for persons with 6/6 vision proved to be 1,300 and 950 respectively. One of these days was a smoky one, and the other dusty, and the varying distances—1,300 and 950 yards—show how impossible it is to give an absolute value to 6/6 vision as tested by semaphores. In both the latter cases the semaphore was seen against the clear sky.

A practical test of the kind would have to be conducted with the same semaphore, on the same background, and the standard would have to be fixed each day of the examination by taking some one out with the examinee who had vision 6/6, and setting the standard for that particular day before testing. An open air test of the kind would therefore in all probability be valueless, and might be dangerous. If, however, it is the wish of the Department to have an actual test with a semaphore, it would be a very easy thing to construct one on a reduced scale, set it in the passage at my office (100 feet long), place it against a uniform background, and work out the scale. There is, however, no advantage in so doing since the result must be the same as that given with test types.

It came as a surprise to us, however, to find that on certain backgrounds, semaphores may be invisible until the driver is close on them. One of the drivers this morning informs one of us (J.W.B.) that on the Mordialloc Line, near Cheltenham, there is a semaphore with a background of trees, which, in his opinion, cannot be seen more than a quarter of a mile distant. Assuming that such a semaphore as that at Laverton can be seen against the Station House or similar background at 600 yards on a clear day (such as yesterday), it is obvious that on a smoky or misty day it might be

visible only at 400 yards to a person with 6/6 vision, that is, to anyone with 6/12 vision at 200 yards or anyone with 6/9 vision at 270 yards. There is no point in carrying the test any further, but we desire in concluding to recommend :—

1. The 6/6 standard be adhered to for those concerned in the actual running of the train, guards, signalmen, drivers and firemen, whom we may, following the usual practice, call class A.

2. For class B, that is, the remainder of the service, the standard already fixed provides for 6/12 vision in the bad eye, and 6/6 in the good ; but it is a matter for your consideration whether spectacles might not be worn by class B.

3. It is clearly desirable that the various semaphores should be elevated where it is possible against the sky-line, and that where that is impossible a suitable back-ground should in some way be provided. It is further desirable that they should be painted pure white throughout.

Summarising the results of the preceding tests—viz., on February 10th and February 12th. On February 10th, it was found that anyone possessing 6/6 vision could accurately see the arm of the semaphore at 900 yards. With vision of 6/9 that limit of visibility was reduced to 600 yards. On this occasion the atmosphere was smoky.

On February 12 the results varied somewhat owing to dust storms coming on at intervals; but, under the best circumstances, a man with 6/6 vision could distinguish the arm of the semaphore at 1,300 yards, and with 6/9 vision at 900 yards.

On both these occasions the background was uniform, but the conditions of the atmosphere varied.

ANNOTATIONS

The Bowman Lecture, 1923

After a personal appreciation of the invitation received by himself at Washington in 1922 to deliver the lecture, Dr. de Schweinitz paid tribute to the memory of Sir William Bowman, as well as to the Ophthalmological Society of the United Kingdom, of which he was the first President, and entered on his subject, premising that he was utilizing his own experience, and acknowledging his indebtedness to many colleagues in the U.S.A.

A very careful study of the anatomical relations of the pituitary body and adjacent structures opened the subject of the lecture. The practical part of this work had been carried out by Dr. J. Parsons Schaeffer, and the results were brought clearly before the meeting by the series of careful drawings which were exhibited,

as obtained by examination of no fewer than 125 freshly exposed brains. It was proved that in 96 per cent. the optic chiasma is located wholly or in part over the diaphragma sellae, while in some cases the chiasma is found to be wholly behind the diaphragm; the vertical interval between the chiasma and the upper surface of the diaphragm varies from a potential cleft to a space as great as 10 mm. The well known varieties in the shape of the sella Turcica were recapitulated, and it was pointed out that the infundibular stalk had a direction downwards and forwards, and that it was usually in contact with the chiasma. That the diaphragma sellae may vary from an almost complete tentorium to a mere marginal rim was confirmed. The arterial circle of Willis was next dealt with, and examples of abnormalities which would enable the anterior cerebral arteries to exert pressure on optic nerve, chiasma, or optic tract, were exhibited. How an abnormally large posterior communicating artery, sometimes passing direct into the posterior cerebral might be pressed against the optic tract by a pituitary growth, and thus give rise to homonymous hemianopia was indicated. The lecturer considered that neither pressure nor traction on the visual pathways by the tumour, was a satisfactory or complete explanation of the visual field defects in tumours of the hypophysis, and that, in particular, the scotomata were better explained on a toxic theory. He suggested that toxic products of the developing growth might be carried by the perivascular lymph channels to the subchiasmatic cisterna, and thence invade the visual fibres, of which it might be hypothecated that those of the macular bundle, being the most highly specialized, would be found to be the most vulnerable. The lecturer admitted that the nature of such toxins was unrecognized, but considered that some such hypothesis was necessary to explain the clinical manifestations and that his anatomical investigations disclosed the routes by which toxins might operate.

A historical survey of the discovered symptoms dealt with the visual defects and their development and progress both in the periphery and the centre of the fields of vision; and enabled Dr. de Schweinitz to discuss more fully their probable causation, and to review the variations and instability of the perimetric findings which frequently occur in gross pituitary body disorders.

The mimicry by pituitary disease of certain field defects due to other causes, such as toxic amblyopia, and sphenoidal sinus empyema was emphasized; that the latter disorder could involve the chiasma was shown to be possible in certain cases where a rather atypical anatomical relationship existed between the two structures. The possible association of hyper- and of hypo-pituitarism with central nerve disease, such as tabes, must not be overlooked in the analysis of a case, and tumours in the inter-peduncular space

or springing directly from the chiasma might give rise to visual symptoms specially misleading by reason of secondary effects upon the hypophysis. The rapidity of onset of field defects, stationary periods after development, and the significance of temporary amaurosis were considered. Less importance was attached by the lecturer to defects in the colour fields than to those of the form sense, though observations in the one direction should be checked by, and correlated with, those in the other.

In Part 3, the importance of earlier diagnosis and treatment was dealt with. The types of pituitary headache were considered and a plea made for more consideration of this symptom. Fisher's suggestion that some cases now classed as migraine, may be attributable to intermittent swelling of the pituitary body was subjected to criticism but thought worthy of further deliberation.

In Part 4, attention was drawn to functional disorders of the pituitary body, particularly those now established to be almost constantly associated with pregnancy. Dr. de Schweinitz had confirmed the existence of temporal limitation of the fields of vision in the later months of pregnancy, the fields being restored after confinement, but was of opinion that central scotomata and enlargement of the blind spot could not be demonstrated; he argued from this in favour of the toxic influence of the products of the diseased pituitary body, but that the pituitary body, physiologically enlarged during pregnancy, was little likely to produce a harmful secretion, though the mechanical effects would be identical whatever the cause of the enlargement and proportioned only to the bulk of the swelling. Repeated pregnancies were sometimes followed by symptoms of dyspituitarism, due to persistence and extension of changes in the hypophysis initiated by the pregnancies. After double oophorectomy, field changes similar to those associated with pregnancy were found, but were permanent; hyperplasia of the pituitary body was suggested—but more investigation in this direction was desirable.

Attention was pointed to transitory pituitary body symptoms during menstruation, mainly hemianopic and scintillating scotomata, and to those of headache, rapid growth and deposit of fat at puberty; pituitary body feeding was of much value in such cases at adolescence.

In Part 5, the question of toxic effects following influenza or the drinking of methyl alcohol upon the pituitary body was reviewed: experiments by the lecturer upon dogs with methyl alcohol had been fruitful, mainly in the direction of negative results.

In Part 6, the lecturer dealt with Leber's disease, and the theory put forward by Fisher that hereditary tendency to over activity of the pituitary body at puberty or climacteric best explained this interesting form of optic atrophy. The fact that change in the

sella Turcica demonstrable by X-rays was the exception and not the rule in these cases was no argument against the truth of the theory. Dr. de Schweinitz was inclined to suggest as a supplement to Fisher's view his own conception of the transference of toxins from the hypophysis to the chiasma.

In Part 7, the appearance of the discs was pointed out, the best methods of the radiologist were indicated; the significance of the various deformations of the sella Turcica was discussed—surgical treatment was a subject outside the sphere of the lecture—but the methods and value of organotherapy were reviewed, as well as the effects of X-rays and radium, particularly when used subsequent to operation.

A complete bibliography of the whole subject is appended to the lecture, and cannot fail to be of the greatest assistance.

It is impossible to do justice to so valuable and so interesting a lecture in the space at our disposal, and especially in the absence of the drawings, fields and diagrams with which it is illustrated. Above all the absence of the magnetic personality of the lecturer is a defect for which there can be no compensation.

The Aetiology of Miners' Nystagmus

EVERY reader will recall the first Report of the Miners' Nystagmus Committee which was published last year. After a full and impartial discussion the Committee concluded that defective illumination was the essential factor in the causation of the disease. Other factors, such as position, alcoholism, hereditary predisposition, errors of refraction were considered to be merely of secondary importance. These views, reached after a careful review of the subject, have been generally adopted. Dr. A. S. Percival, however, (*British Medical Journal*, May 5 and June 9, 1923), considers, as did the late Simeon Snell, that the primary factor is to be found in the constrained position of the eyes assumed by coal-hewers. He bases his views upon figures obtained from thirty-two pits in the counties of Northumberland and Durham. Of 36,232 men employed by these mines 11,383 were hewers and 24,849 were non-hewers. One hundred and three of the former and fifty-nine of the others acquired nystagmus, in other words, the percentage of hewers with nystagmus was 0.949, and of the others 0.2374. A new theory has also been developed by Dr. Frederick Robson in two papers recently read by him before the South Wales Institute of Engineers. Briefly, Robson believes that the chief cause of miners' nystagmus is the emanations of noxious gases from coal which has been recently cut. He particularly specifies carbon monoxide in this connection. He points out that, in the South Wales and Monmouthshire coal field there is a progressive diminution in the

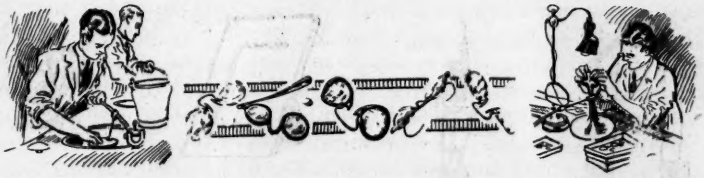
volatile matter in passing from east to west, and a corresponding decrease in the nystagmus. In the meantime we feel that it would be a mistake to disregard the recommendation of the Miners' Nystagmus Committee, namely, to improve the illuminating conditions under which the miners work.

ABSTRACTS

I.—CARCINOMA OF THE CHOROID

Greenwood, Allen (Boston, Mass.).—Carcinoma of the choroid. Internat. Congress of Ophthal., April, 1922.

The salient facts of the four cases of carcinoma of the choroid reported by **Greenwood** were as under: 1. A man came on account of acute glaucoma of one eye. The fundus of that eye, after the glaucoma had been relieved by miotics, showed in one part a separation of the retina, covering a flat, greyish-white mass. The liver was enlarged, and as it seemed doubtful if the case was one of sarcoma or carcinoma, the eye was not removed. Prior to death, the brain became involved. At the autopsy the primary source of the general carcinomatosis was found to be the prostate. The organs more particularly involved were the lungs, pleura, peribronchial glands, liver, brain, and eye. In this case the eye condition was the first to call attention to the possibility of disease in other parts of the body. 2. A woman of 48 complained of one eye, the sight of which was reduced to hand movements in the outer field. Retinal separation was found, through which could be seen a white mass raised towards its central part about 3D. and flattening out in all directions. It is compared by the author to some substance such as cheese inserted under the retina. Patient found to be affected with cancer of the breast, involving lung and axillary glands. Some four months later carcinoma found in the other eye. Death from cerebral involvement. 3. Woman, aged 60 years, vision failing in both eyes for several months. Two years previously breast amputated and axilla cleared of carcinomatous glands. Detachment of retina, with underlying greyish mass, in each eye. Patient died with cerebral symptoms. 4. Woman, aged 36 years, R.V. 20/30 a very flat, round, white, discoid subretinal mass found down and out from macula of R.E. History of operation about a year previously for mammary cancer. X-ray examination showed extensive involvement of one lung.



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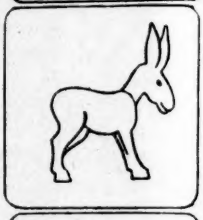
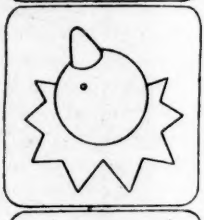

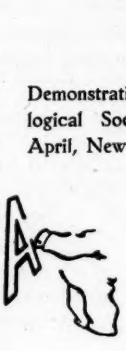

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Demonstrating at the Ophthalmological Society's Exhibition, in April, New Models in Test Cases.

Examination of Greenwood's four cases discloses some facts worthy of notice. In all, X-rays, autopsy, or physical signs showed that the lungs were involved. In fact, the finding of a whitish, discoid, subretinal tumour, without reaction or independent vascular system, should lead to careful examination of the lungs. Pain and increased intraocular pressure are the only complications that call for removal of the eye, although a doubt as to the growth being a sarcoma would justify it. Carcinoma is usually seated posteriorly, projects but little to the vitreous, spreads rapidly, but remains flat. Vision is soon lost. Tension is not usually disturbed in the early stage. The tumour is always metastatic and the primary focus can generally be found. Treatment is palliative and prognosis inevitably bad.

S. S.

II.—REMEDIES

(1) **Moore, R. Foster (London).—A case of cure of detachment of retina.** *Lancet*, July 23, 1921.

(1) **Foster Moore** publishes, with diffidence and much restraint, what appears to be a cure of a case of retinal detachment by a method he has been in the habit of employing. It is a myopic case with " a large transparent retinal detachment down and out." The routine treatment referred to is as follows :—Confinement to bed; injections of 5 per cent. sodium chloride and 5 per cent. sodium citrate solutions, with the addition in each case of 4 per cent. novocain, in amounts of about 15 minims, under Tenon's capsule over the site of the detachment. The injections of these two solutions are made alternately every three days. Nine or ten injections in all. After the treatment in this case five of Foster Moore's colleagues failed to find any evidence of detachment. The Editor of the *Lancet*, making the case the text for a note on retinal detachment and the difficulty of its treatment, points out that the retina has not been re-attached for a sufficiently long period (a few weeks) to warrant the word " cure."

ERNEST THOMSON.

(2) **Virgilli, Rovirosa (Madrid).—Treatment of infective keratitis by vaccines. (Tratamientos de las queratitis infeccioasas por las vacunas.)** Internat. Congress of Ophthal., Washington, D.C., April, 1922.

(2) **Virgilli** reports results secured in the treatment of ocular disease with vaccines, more especially with the staphylococcus

vaccine in suppurative keratitis. In all the cases of keratitis treated in that way were observed rapid cicatrization, absence of scarring, and in most of the cases preservation of function. Vaccines, therefore, deserve to occupy the first place in the treatment of ulcerative keratitis. Virgilli prefers the polyvalent stock vaccines, but in the event of their being inefficient auto-vaccines may be employed. When in place of sera, vaccines are used toxins are injected compelling a reaction on the part of the organism, which produces antibodies that destroy the germs and neutralize their toxins. Cases of panophthalmitis are cited in which enucleation had been recommended, but which retained the eye under vaccine treatment. All cases of marginal blepharitis were benefited, mostly by staphylococcus vaccine, but in one instance by an auto-vaccine containing streptococcus.

S S.

(3) **Davis, A. Edward (New York City).—Serum and vaccine treatment for the prevention and cure of cataract.** Internat. Congress of Ophthal., Washington, D.C., April, 1922.

(3) The special sera and vaccines used in **Davis's** experiments were cytolytic in nature, that is, they were secured by injecting the crystalline lens tissue of one species into another, producing a lytic substance (a cytolysin) in the blood of the latter. The sera from the blood of the injected species when reinjected into the species furnishing the antigen have a dissolving or lytic effect on the special tissue used as antigen—the crystalline lens in these experiments. In other words, they act similarly to the haemolysins; in fact according to Guyer and Smith, all haemolytic sera so far studied have been found to be more or less haemolytic in action. Like the haemolysins, they are also specific in action on the special tissue used as the antigen in the sensitizing process. However, they are not absolutely specific, as homologous tissues may be affected to a slight extent, *e.g.*, the vitreous, when lens is used as antigen. According to Ehrlich and his school, the lack of absolute specificity is due to the fact that more or less homologous tissues may have common receptors.

Davis concludes as follows: " The crystalline lens, like uveal pigment, is organ-specific and not species-specific; and according to Hektoen, lens protein may be regarded as chemically distinct and as identical in diverse species. In the first experiments only anti-human rabbit cytolysins were used, but later other lens proteins were used in preparing the cytolysins.

The antigen in all these cases was given intravenously in preparing these sera; also the sera and vaccines were administered

to the patients intravenously, at about five-day intervals. Intradermal tests were made on the patients from time to time to test the sensitiveness of the patients to the treatments." S.S.

III.—BLACK CATARACT

Rollet, Prof. (**Lyons**) and **Bussy, Dr.—Black cataract.** (**La cataracte noires.**) *Arch. d'Ophtal.*, Feb., 1921.

Rollet and **Bussy** have taken the opportunity of an unfortunate experience with a black cataract to write an interesting little monograph on the subject. Their patient was a man of 60, who had had a black cataract operated on by Dor ten years previously. This operation was followed by severe inflammation, which had left only a sightless stump which was very hard and contained bone. The other eye had slowly developed a complete black cataract. In view of the bad results following the first operation extra precautions were taken before operating on the left eye. These included the removal of the right stump and careful treatment of the conjunctiva and lacrimal apparatus. The operation was quite straightforward, and was made with an iridectomy and a large flap. All went well for a week, and then cyclitis set in, and three months later the eye was soft and vision was only quantitative with uncertain projection.

The paper then gives a most interesting account of the history of black cataract going back to Maître-Jan in 1707. The difficulty of diagnosis without an ophthalmoscope led most surgeons to disbelieve in its existence altogether, and even, *horribile dictu* (but, of course, this was a long time ago), to suggest that it was merely a method of extracting money from the pockets of the unfortunate victims by operating on clear lenses.

The authors obtained three lenses and used one half of each for histological examination, and the other half for chemical analysis. They sum up the results as follows:—

"Black cataract is the final term of a series which includes all senile cataracts from the clear yellow ones to those that are absolutely black. A deep tint is not sufficient by itself to determine this clinical and anatomical individuality; it is necessary that the tint should affect also the cortical layers, and that the whole lens should be black. In this case only has the variety a real clinical existence and presents some difficulty in diagnosis. It must not be confused with certain dystrophic cataracts, secondary to traumatism or intraocular haemorrhage. It affects elderly subjects and develops very slowly. The prognosis of operation is not so good as in the ordinary variety. It is characterized by densification of the lens fibres which resemble serrated

fibres, and show neither granulations nor globules, nor destructive process, nor pigment of any sort. The dark tint of black cataract is due to the presence of oxidised tyrosin in the interior of the lens."

A comprehensive bibliography accompanies the paper.

E. E. H.

IV.—PSEUDOBLASTOMA OF THE ORBIT

Mairbaix, Dr. (Tournai) and van Duyse, Prof. D. (Ghent).—Pseudoblastoma of the orbit. Pseudoleukaemic lymphomatosis (lymphocythaemic). (Lymphomatose pseudoleucémique (lymphocytémique). *Arch. d'Ophtal.*, August, 1921.

Marbaix and van Duyse record a case of orbital tumour in a girl of eleven. When first seen the patient had slight ptosis on the right side and almost complete limitation of movement of the globe except outwards. The globe was pushed outwards and forwards, but could be pushed back readily without pain and was quite moveable under pressure. There was paralysis of accommodation and of the pupil, but distant vision was not interfered with. As the proptosis got more marked and was accompanied by pain it was decided to expose the orbit by a Krönlein's operation. At this operation the lacrimal portion of the orbital gland was removed. A fortnight later the cornea, which was quite insensitive, showed some opacity. This post-operative paralytic keratitis cleared up and vision remained normal. There was at no time any evidence of implication of the optic nerve. No definite tumour mass could be made out at the time of operation with the exception of the enlarged lacrimal gland. The microscopical examination of this structure gave the explanation of the condition. This showed foci of perivascular lymphocytes with hyaline degeneration of the interstitial connective tissue and vessel walls. Blood tests gave an excess of lymphocytes with a slight diminution of red blood corpuscles and indicated a condition of pseudoleukaemia.

The authors discuss the views of other writers, more particularly those of Birch-Hirschfeld, and conclude as follows:—

"The chronic inflammatory lymphomatosis frequently described in the orbit may be the expression of a general affection of a not very obvious type and connected with lymphocythaemia.

Among the methods in clinical use for the diagnosis of orbital tumours the quantitative determination of the haematological formula must not be omitted.

In a case of definite lymphocythaemia, the neoplasm being derived from the leucocythaemia, treatment by arsenic or radium should take the place of any operative interference."

Drawings of the microscopic appearances of the lacrimal gland and a bibliography accompany the paper. E. E. H.

V.—RECURRENT HYPERAEMIA OF THE EYELIDS

Weekers, L., and Halikin, H.—Paroxysmal recurrent hyperaemia of the eyelids. (Hypérémie paroxystique récidivante des paupières.) *Arch. d'Ophtal.*, Nov., 1921.

Weekers and **Halikin** under this heading describe a condition which they consider has not so far received attention. The case described was that of a boy of fifteen who had suffered from the age of eight from recurrent attacks of swelling, redness, tenderness and discoloration of the left eyelid. At first the recovery was complete and rapid, but gradually the lid became flabby and thick. When first seen by the authors he had had no attack for six months, and has had none since. Vision had never been affected, but on several occasions there had been bleeding from behind the upper lid. Examination showed marked ptosis with discoloration of the skin, which was wrinkled and roughened like shagreen. The conjunctiva of the upper lid was injected, as was also that of the upper part of the globe. This injection was much increased by the most gentle manipulation. The lower lid was perfectly normal. The general health and family history of the patient were excellent in every respect. A semilunar piece of skin was excised with excellent results from a cosmetic point of view. A careful microscopic examination of the piece removed showed the following principal changes:—

"1. Vascular proliferation specially marked in the layers beneath the skin: subcutaneous, muscular and pretarsal tissue, with no indication of any inflammatory reaction.

2. Dilatation with moderate inflammatory reaction of the small vessels of the dermis, but chiefly localized oedematous displacement of the dermal tissue and dilatation of the lymphatic spaces.

3. The almost complete disappearance of the elastic tissue.

4. Diminution of the epidermis."

The authors consider that the disease should be classed amongst the dermatoses and discuss the various allied skin affections previously described by dermatologists.

A photograph of the patient and also of the microscopic sections accompany the paper. E. E. H.

VI.—MISCELLANEOUS

(1) **Vail, Derrick T. (Cincinnati).—Monocular retrobulbar optic neuritis from hyperplasia of the ethmoid bone.** Report of three cases with operation. *Amer. Jl. Ophthal.*, February, 1919.

(1) Vail defines hyperplasia as an increase of the connective tissue elements of living anatomic structures, due to a low grade of localized inflammation. It is a non-suppurative process taking the form of a rarefying osteitis associated with inflammatory swelling and fibrous thickening of the mucous membrane lining its cavities, causing oedematous tissue to fill them. The lining wall is also thickened and the entire organ is enlarged so that the orbital wall is involved as well as the nasal. Apart from ocular complications the symptoms are said to be trivial and the disease is common. The reason of the rarity of affection of the optic nerve is due to the anatomical arrangements of the posterior ethmoidal cells which only occasionally come into close contact with the optic canal. The author discusses at some length the symptomatology of retrobulbar neuritis, the only distinctive feature of the class of case he treats of being the fact that it is always uniocular. He admits that it may be impossible to recognize any disease of the ethmoid before operation. Careful radiography is of great assistance, oblique exposure of the ethmoid showing distinct cloudiness of posterior ethmoidal cells in two of his three illustrative cases.

Case I was a man of 35 years, who was a total abstainer from alcohol and tobacco. When first seen, twelve days after the vision of the right eye became misty, he was unable to count fingers with it, vision in the other eye was normal. There was a large absolute central scotoma. A fortnight after exenteration of the right ethmoidal labyrinth vision was 20/50, and the scotoma was much smaller. One year later vision was 20/20 and Jaeger 1, but the disc was very white, especially on the temporal side.

Case II was a woman of 18 years, who had suffered two weeks previously from a cold in the head with conjunctivitis. The right eye was normal in every respect, but the left eye had only 20/200, with a large absolute central scotoma. Details of fundus quite hazy owing to presence of a definite neuro-retinitis. Exenteration of left ethmoid showed pus in the cells, although previous rhinoscopic examination had been negative. A year later vision was 20/70, and the disc atrophic, scotoma considerably smaller.

Case III. A woman of 60 years, who had completely lost the sight of the right eye three weeks previously. The vision of the left eye was normal; there was no perception of light in the right. Nasal examination showed no abnormality. The right ethmoid was exenterated. Thirteen months later she could count fingers

eccentrically, and the peripheral field was normal, but a large central scotoma remained. The disc was atrophic.

Vail considers that his cases illustrate two distinct types of affection due to the ethmoid; cases one and three being due to pressure producing a transverse neuritis, while case two being combined with neuro-retinitis shows the effect of a septic process in producing an interstitial neuritis.

We have all met with cases of uniocular and binocular retrobulbar neuritis which have recovered good vision, even after that has been reduced to mere perception of light, without any surgical interference. Some of these have turned out later to be the precursors of disease of the central nervous system. It seems a little heroic to submit patients to such an operation as exenteration of the ethmoid in the absence of any more direct evidence of the involvement of that structure than the presence of retrobulbar neuritis.

E. E. H.

(2) **Sauvineau, Ch.—The origin and the aetiological treatment of disease of the lacrimal passages. The importance of lacrimation due to hypersecretion. (Origine et traitement étiologique des maladies de voies lacrymales. Importance du larmoiement par hypersécrétion.)** *La Clin. Ophtal.*, January, 1920.

(2) **Sauvineau** tilts at the treatment of lacrimal obstruction by catheterisation, which treatment is founded, he says, on the supposition that stricture is the cause of the lacrimation and subsequent infection. He holds, on the contrary, that " in the immense majority of cases " lacrimation comes first, is due to hypersecretion, causes stagnation by overtaxing the channels, and is followed by infection and consequent stricture. The cause of the lacrimation is an error of refraction or of convergence. It follows that during the period of simple lacrimation probing is wrong. An injection of sterile water will show in these cases (the " immense majority " of cases as stated above) that the duct is patent and the obvious treatment is correction of the error of refraction or of convergence. Whether this argument is conclusive or not it is at any rate suggestive.

ERNEST THOMSON.

(3) **Verderame, Philippe (Turin).—The visibility of the corneal nerves under pathological conditions. (Visibilité des nerfs cornéens à l'état pathologique.)** *Revue Générale d'Ophtal.* December, 1920.

(3) Only a few observers have described the clinical appearance of the corneal nerves, and that mainly under normal conditions. The interest of **Verderame's** communication lies in the fact that in a

case of intensely painful syphilitic irido-cyclitis the corneal nerves were observed by ordinary focal illumination, and disappeared from view when the inflammation passed off. The nerves appeared as delicate white threads, radially disposed, and much more visible at the periphery than towards the centre of the cornea. They were observed to branch dichotomously and sometimes trichotomously, thus forming a finer and finer arborisation. No trace of blood vessels was found even on high magnification. Verderame considers that the visibility of the nerves in this case resulted from a specific inflammation of the nerves and the neighbouring tissue, that is, a neuritis and perineuritis. As the inflammatory products were resorbed the extreme tenderness of the eye disappeared, and with it the visibility of the corneal nerves.

ERNEST THOMSON.

(4) **Duverger, M.—On the repair of the angles of the lids. (De la refection des angles des paupières.)** *Arch. d'Ophtal.*, Jan., 1921.

(4) **Duverger** in a previous paper, described his method of lid suture in two planes to obviate the formation of a coloboma (*Arch. d'Ophtal.*, 1917). In the present paper he describes certain modifications necessary when the tear is near either angle. In such case it is not possible to obtain a skin flap with raw surface (the essential point in the operation) in the way previously described. The flap required is obtained by an incision up and in or out according to the angle affected. In suturing the internal angle in order to sustain the weight of the lid and prevent subsequent ectropion he makes use of a double armed suture passed with the loop of the thread in the thickness of the internal lateral ligament. Without reproducing the excellent diagrams that accompany the paper it is not possible to explain adequately the details of the technique which should be studied in the original.

E. E. H.

(5) **Le Roux, Dr. H. (Caen).—Two cases of herpes of the cornea after antityphoid vaccination. (Deux observations d'herpès de la cornée consécutif à la vaccination antityphöidique.)** *Arch. d'Ophtal.*, Feb., 1921.

(5) **Le Roux** has had under his care two cases of this rare sequel to antityphoid vaccination. The first patient, a soldier of 28 years of age, had suffered from an attack of an eruption, presumably herpetic, on the right side of the face in 1914. In 1915 he had two injections of the vaccine at an interval of eight days without any special reaction. In 1916 he had another injection which was followed fifteen hours later by high fever. The following morning a herpetic eruption began near the mouth and spread

upwards to the right fronto-temporal region and both ears. The next night the right eye became painful. A corneal ulcer developed and the lids were also affected. A fortnight later all injection had disappeared, but three days later there was a fresh outbreak on the face and the eye again became red. Recovery with normal vision took place at the end of six weeks.

The second patient was a soldier of 18 years of age, who was given three injections at intervals of one week. Three days after the last injection he had a marked general reaction, and his left eye was affected with typical herpes. He was discharged as convalescent a month later.

In both cases the corneal affection was of the dendritic type.

E. E. H.

(6) **Koby, Dr. F. Ed.—Inferior uniocular hemianopia with retinal alterations visible specially with the red-free light. (Hémianopsie inférieure monoculaire avec altérations rétiniennes visibles surtout a la lumière anérythre.)** *Arch. d'Ophtal.*, June, 1921.

(6) **Koby's** patient was a man of 40 years, who complained of being unable to see more than half of an object with the left eye. He gave a history of sudden obscurations of vision dating back twenty years. The first of these attacks affected both eyes and was described as appearing like a veil. Later attacks had always been confined to the left eye. The last attack occurred a month before he came under observation, and had persisted. The field of vision of this eye was cut off inferiorly by a line almost exactly horizontal which missed the point of fixation. Vision of the left eye was 0.5, and could not be improved. His general condition and history showed no cause for the hemianopia. Ophthalmoscopic examination: O.D. pale, particularly in the upper half. Superior arteries markedly contracted, some completely obliterated and surrounded by a white sheath. The central foveal reflex was absent. Red-free light showed loss of retinal fibre plan in upper half of retina. Koby discusses the aetiology of these arterial spasm cases and lays stress on the value of red-free light in determining the functional condition of the retina. A chart of the field of vision and a drawing of the fundus accompanies the paper.

E. E. H.

(7) **St. Martin (Toulouse).—Acute unilateral retro-bulbar neuritis of dental origin. (Névrite rétro-bulbaire aiguë, unilatérale d'origine dentaire.)** *La Clin. Ophtal*, June, 1921.

(7) **St. Martin**, after pointing out that many cases of retro-bulbar neuritis which have been attributed to dental disease are not sufficiently proved to have such an origin, reports a case of his

own of a woman aged 27 years, in whom he considers that he excluded every other possible cause. The two premolars on the corresponding side were very carious, while pressure on the gum over their roots was painful. The teeth were extracted. At the root extremity of the second premolar there was a large infected cyst and a purulent alveolar cavity. Improvement in vision commenced within 48 hours, and at the end of three weeks vision was normal, while, on ophthalmoscopic examination, no trace could be found to indicate that anything had been wrong with the eye.

ERNEST THOMSON.

(8) **Beauvieux, Dr., and Pesmé, Dr. P. (Bordeaux).—Tuberculous dacryo-adenitis; attenuated tuberculosis of the lacrimal gland. (La dacryo-adénite tuberculeuse; tuberculose atténuée de la glande lacrimale.)** *Arch. d'Ophtal.*, Jan., 1922.

(8) **Beauvieux** and **Pesmé** describe a case of tumour of the lacrimal gland which they consider should be included in the group called attenuated tuberculosis of that structure by van Duyse in 1896. Their patient was a man of 41 years of age, in sound health and with an excellent personal and family history. The tumour, which occupied the position of the lacrimal gland, had grown very slowly and given rise to hardly any symptoms. It was very hard, mobile, and apparently encapsuled. On the supposition that it was of the nature of a fibroma it was decided to remove it after the failure of anti-syphilitic treatment to produce any alteration (there was no history of syphilis and the Wassermann reaction was negative). The tumour, which extended deeply into the orbit, was easily removed and healing proved uneventful. Microscopical examination showed a proliferation of dense fibrous connective tissue enclosing spaces which contained glandular acini, inter-acinous connective tissue and inflammatory cells of new formation. Some of these latter showed the more or less typical structure of tuberculous follicles with giant cells and lymphocytes. There was no trace of caseation. No tubercle bacilli were found, but injection of a part of the tissue into a guinea-pig gave rise to tuberculous peritonitis.

The authors discuss the differential diagnosis of tumours of the lacrimal gland and deal with the work of other observers.

They sum up their conclusions as follows:—

"1. Tuberculosis of the lacrimal gland is a very rare affection which may take one of two clinical forms:—

(*a*) The caseous form (exceptional).

(*b*) The sclerosing form, the one commonly observed.

2. It may occur in genuinely tuberculous individuals, or in

young persons or adults apparently free from any tuberculous blemish.

3. The glandular infection is carried by the blood. It is, therefore, secondary either to a recognized lesion or to a deep focus that has not been identified.

4. It follows an attenuated and but slightly virulent course, and is characterized anatomically by an infiltration of perivascular and periacinous inflammatory cells with the presence of typical or atypical giant cells. Sclerosed fibrous tissue predominates, forming a barrier to infection and limiting it to small islands in the middle of which normal and destroyed acini appear. The absence of the bacillus of Koch is to be noted.

5. Attenuated tuberculosis of the lacrimal gland presents itself in the form of a hard tumour with slightly bossy surface, moveable, painless and capable of spontaneous retrogression. It may be uni- or bilateral.

6. Local prognosis is favourable on account of its structural peculiarities: general prognosis depends on the degree of tuberculization of the patient.

7. The affection may be confused with benign tumours of the lacrimal gland (adenoma, adeno-fibroma) and particularly with simple sclerosing hypertrophy (chronic dacryo-adenitis), which it resembles even histologically. The diagnosis can only be established by experimental inoculation on the guinea-pig.

8. Treatment may be expectant on account of the possible spontaneous regression. The only rational treatment, however, is extirpation of the neoplasm."

E. E. H.

(9) **Chaillous, M. J. (Paris).—Papilloedema and decompression. (Stase papillaire et craniectomie décompressive.)** *Bulletins et Mémoires de la Societé française d'Ophtalmologie*, 1922.

(9) **Chaillous** pleads for earlier interference in cases of papilloedema, and gives a short series of six cases where decompression was of value in preserving sight. The risk of the operation is much increased if accompanied by opening of the dura. The important question is as to when interference should take place.

(1) If vision is normal or nearly so, operation may be postponed while energetic antispecific treatment is carried out.

(2) If treatment does not relieve headache or reduce papilloedema and vision is from 5/10 to 6/10, decompression should be resorted to without delay, and repeated a second time if necessary.

(3) In all cases where vision is reduced to 2 - 3/10. Here, however, prognosis as regards preservation of sight is very guarded. If stasis does not disappear after craniectomy the dura should be opened.

Three of his cases had a history extending over 6 to 9 years after operation. Full vision, or at any rate sufficiently good sight, was preserved for the patient to be enabled to exercise a profession.

CHARLES KILLICK.

(10) **Koeller, H., and Hoffman, P. (Wuerzburg).—The influence of the vestibular apparatus on the innervation of the eye muscles. (Der Einfluss des Vestibularapparates auf die Innervation der Augenmuskeln.)** *Arch. f. Augenheilk.*, Vol. XC, Parts 2 and 3, 1922.

(10) Experiments were made upon rabbits to determine the effect of the vestibular "apparatus" on eye movements in rotation nystagmus, after-nystagmus, and when the labyrinth had been destroyed. The influence of the vestibular apparatus both in the waking and unconscious states shows itself by increasing or lessening the electric current variations of the "resting" tetanus of the muscles, according as the muscle under consideration is actually contracting or relaxing. On the other hand the frequency of the "resting" tetanus is not demonstrably influenced by it. There was no evidence of any special vestibular innervation mechanism of recognizable rhythm. The cutting out of vestibular innervation by destruction of both labyrinths did not do away with the currents of action of the muscles.

In the opinion of the authors of this paper it is unlikely that pairs of antagonistic muscles in the eye experience simultaneously any notable increase of their tone from the labyrinth.

JAMES FISON.

BOOK NOTICES

Optical Methods in Control and Research Laboratories. Vol. I, edition II, 1923. J. N. GOLDSMITH, S. JUDD LEWIS and F. TWYMAN. Adam Hilger, Ltd. 56 pages. Nine illustrations. Price, 1s. 6d.

The eye holds a unique position among the other organs of special sense, because of the accuracy with which it can effect certain kinds of comparison. It is for this reason that vision is made use of in almost all types of precise measurement. The ability of the eye to judge when two lines coincide caused the introduction of the vernier. The colorimeter and spectrophotometer were made possible because the eye can detect small inequalities of intensity and colour. New methods making use of the accuracy of

visual measurements are therefore of very great value. Research work extending the use of such methods should be considered of the utmost importance.

It follows that books dealing with such methods should be within the immediate reach of all who work in laboratories, and that this book on optical methods should be included in their number.

The object of the book is clearly stated in its preface. It is intended to deal with practical problems, to suggest the use of optical methods of precision, and to act as a guide in their selection. It contains in Section I a description of methods of measurement of emission spectra for metallurgical and analytical purposes. The apparatus and the methods of using it are discussed and many references are given to original work.

In Section II will be found a description of the methods of measuring absorption spectra by means of the "spectrophotometer." Methods dealing separately with ultra-violet and visible regions of the spectrum are described, together with a number of examples admirably illustrated and again accompanied by a valuable collection of references.

Refractometry next receives consideration in Section III. Commencing with a brief history, it passes on to various types of instrument and finishes up once more with numerous references.

Lastly, in Section IV will be found a brief survey of some of the applications of the polarimeter. Notable as has been the part played by this instrument in the past in dealing with biological problems, there is little doubt that a more notable future awaits it.

Enough has been written to show that this book is one of great value. Not only does it give a concise account of the application of certain optical methods, but it also repeatedly refers to research work done on the same or on kindred lines. No photographer will deny the value of the Kodak books, *e.g.*, in their extension of methods of light filtering by means of colour screens. This book will be a valuable incentive in the use of optical methods.

Transactions of the American Ophthalmological Society. Fifty-eighth Annual Meeting. Vol. XX. Philadelphia. 1922.

This substantial volume of 367 pages represents the proceedings of the fifty-eighth general meeting of the American Ophthalmological Society, held at Washington, D.C., in May, 1922, under the presidency of Dr. William M. Sweet. It is liberally illustrated in black and white and includes two coloured plates. From the minutes of the proceedings we gather that the Medal of Research of the Society has been awarded to Dr. Carl Koller for his discovery of cocain nearly forty years ago, a well-deserved if somewhat belated honour.

Dr. W. H. Wilmer, of Washington, D.C., was elected President for the forthcoming session. The volume contains many excellent and suggestive communications, including three by foreigners: (1) J. Gray Clegg, "Central Scotoma in Uveitis"; (2) D. A. Magitot (*a*) " Cyst of the Iris," (*b*) "Demonstration of the Development of the Human Eye." These and other communications will be abstracted in these columns in due course.

S. S.

NOTES

Société française d'Ophtalmologie

WE are indebted to Dr. René Onfray, the Secretary of the Society, for the following note.—The thirty-sixth Congress of the Society held in Strasbourg was opened on June 11 by the discussion of the report presented by Dr. van Lint (Brussels) on " Subconjunctival Medication." The remainder of that day and the two following days were devoted to the reading and discussion of numerous papers concerning diseases of the eye. Among the foreign members of the Society attending the meetings were Professors Gallemaerts of Brussels, and van Duyse of Ghent, Sir George Berry, M.P., and Messrs. Lawford and Paton of London, Dr. George Mackay of Edinburgh (who presided at one of the *Sèances*), Professors Angelucci of Naples, and Viterbi of Bergamo, Drs. Barraquer of Barcelona, and A. Dufour of Lausanne. A large number of oculists from all parts of France were present, among them Professor de Lapersonne, Drs. Morax, Rochon-Duvigneaud, Terrien, Chevallereau, Valude, Landolt, Kalt, Dupuis-Dutemps, and Monthus (Paris), Lagrange and Fromaget (Bordeaux), Rollet and Dor (Lyon), Aubaret (Marseilles), Villard (Montpellier). Professor Duverger, and Drs. Redslob and Weill, who conveyed the invitation of the Faculty of Strasbourg University, and of the Hygienic Exhibition to the Society to participate in the Pasteur Celebrations at Strasbourg, have reason to be proud of the success of the Congress, which in many of its characters resembled an international Congress.

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The Annual Meeting of the British Medical Association

The ninety-first Annual Meeting of the British Medical Association will be held at Portsmouth from July 24 to July 27. The section of ophthalmology will meet on two days. A couple of discussions have been arranged. The first, on July 26 will be "The Clinical

Significance of Scotometry," to be opened by Mr. A. H. H. Sinclair; the second, on July 27 will be on "Ophthalmology in its Relation to the Army, Navy, and Air Force." Air-Commodore D. Munro will speak, and other officers of the R.A.F. from the Army and Navy. The officers of the section are as follows:—President: Sir John H. Parsons, C.B.E., F.R.S.; Vice-Presidents: W. S. Inman; Ransom Pickard, C.B., C.M.G.; Honorary Secretaries: M. W. B. Oliver, O.B.E., 128, Harley Street, London, W.1; J. A. Valentine, South View Lodge, 53, Kent Road, Southsea.

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Cocain Substitutes Committee

The Minister of Health, after consultation with the Medical Research Council, has appointed a Committee "to investigate the comparative value, for the therapeutic purposes for which cocain is at present used, of various possible substitutes, and the evidence as to risk, if any, of such substitutes becoming drugs of addiction." The Committee consists of:—Dr. J. Smith Whitaker, a senior medical officer of the Ministry (chairman); Dr. Norman J. Bennett, surgeon, Royal Dental Hospital, London; Dr. R. W. Branthwaite, a Commissioner of the Board of Control; Dr. T. Carnwath, a medical officer of the Ministry; Dr. J. H. Chaldecott, senior anaesthetist to St. Mary's Hospital, Paddington, nominated by the Anaesthetics Section of the Royal Academy of Medicine; Dr. H. H. Dale, of the Medical Research Council; Dr. T. B. Layton, surgeon in charge of the Throat and Ear Department of Guy's Hospital, nominated by the Laryngological Section of the Royal Society of Medicine; Dr. G. F. McCleary, a medical officer of the Ministry; Mr. R. Foster Moore, surgeon, Royal London Ophthalmic Hospital, nominated by the Ophthalmological Section of the Royal Society of Medicine; Sir William Henry Willcox, nominated by the Home Office. The Secretary is Dr. E. W. Adams, Ministry of Health, Whitehall, S.W.1, to whom all communications relating to the work of the committee should be addressed.

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Appointments

W. CLARK SOUTER has been appointed Honorary Ophthalmic Surgeon to the Maternity Hospital, Aberdeen.

MAURICE H. BARTON has been appointed Ophthalmic Surgeon to the Royal Infirmary, Leicester.

ARNOLD FERGUSON has been appointed Ophthalmic and Aural Surgeon to the Jersey General Hospital.

American Academy of Ophthalmology and Oto-Laryngology

The twenty-eighth Annual Meeting of this Academy will be held in Washington, D.C. October 16 to 20 inculsive, with headquarters at New Willard Hotel. Sir William Lister will be the guest of honour. The Committee of Instruction has prepared an excellent programme.

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Slit-lamp microscopy

Professor A. Vogt will give a course of slit-lamp microscopy in the University Eye Clinic at Zürich, extending from the 3rd to the 8th September. The class can accommodate thirty-three members, and those wishing to attend should give notice before July 15 to the University Eye Clinic, Rämistrasse, 73, Zürich, together with the fee, 70 francs.

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Corrigendum

An abstract (Ocular Symptoms in Little's Disease) was published on page 297 of the last number of the BRITISH JOURNAL OF OPHTHALMOLOGY. The last four lines of this abstract should read as follows and not as printed:—" When the rod was placed before the right eye, the streak of light was 6° below, and when it was transferred to the left eye, the streak was still below, and it required an 8° prism base down to bring it level with the light. 3. A boy, aged four years, with nystagmus on lateral excursions of the eyeballs."